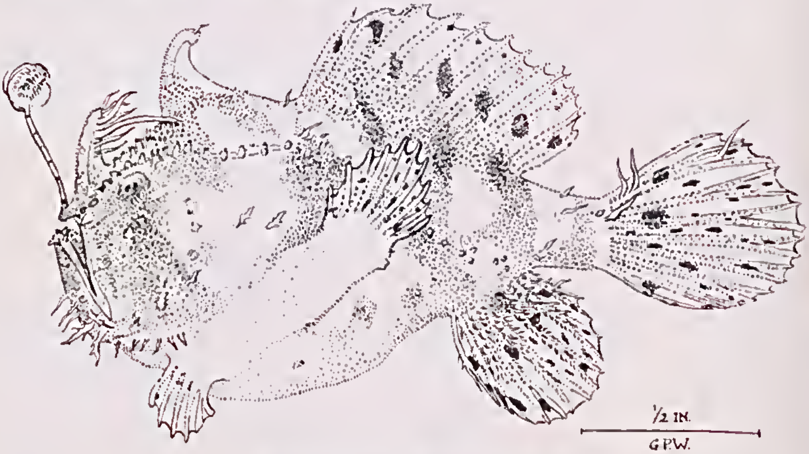
Body covered with prickles. Some dermal flaps on flanks and fins. Lateral line well developed around eyes, preoperculum and mouth, along upper part of sides and dipping to above posterior anal rays, then ascending caudal peduncle.

Stalk of illicium smooth and slender, its base overhanging mouth-opening. Esca large with three or four clenched plume-like lobes. Second dorsal spine shorter and thicker than first (the illicium), prickly and with long fleshy processes and followed by a membrane. A smooth, sunken illicial trough, above and behind the eyes, receives the second dorsal spine and its processes when adpressed. Third dorsal spine erect, with curled tip and membrane uniting it to soft dorsal, subequal to second dorsal spine and 2½ in head. Third to ninth soft dorsal rays longest. Most dorsal rays simple, others only slightly bifid near tips. Last ventral and most of anal and caudal rays deeply divided. Anal fin opposite posterior half of soft dorsal and, like it, free from caudal, leaving pronounced peduncle. Fourth anal ray longest, sub-equal to height of soft dorsal, but less than the expansive caudal. Pectorals well incised; ventrals stumpy.

Colour in alcohol, light brownish with irregular darker brownish-grey areas flowing down sides of head and body. Dark brownish-grey spots on fins become almost black in places. Illicium yellow, ringed with pale brown. Eye blue. Tongue yellowish. Esca light brown with grey bases to lobes. No white spots on body and no translucent spots on caudal fin. General facies as figured.

Differs from other species in its coloration, fin-counts, long first dorsal spine with large illicium and esca and in its outlines. The expansive anal and caudal fins separated by the well-developed caudal peduncle are noteworthy.

Described and figured from the unique holotype, Australian Museum registered no. IB.2979, a specimen 40 mm. in standard length or 53 mm. (2.1 inches) overall.



Antennarius glauerti sp. nov.

Locality: Exmouth Gulf, Western Australia; taken in a prawn trawl on August 3, 1952, by Mr. K. Godfrey aboard m.v. "Laneelin," working for the C.S.I.R.O. Division of Fisheries.

Comparison with other species: *Antennarius glauerti* is distinguished by its large esca and long illicium (longer than the dorsal spines) arising from a nose-like snout overhanging the upper jaw; the dermal processes are particularly long on the middle dorsal spine; the caudal peduncle is free and slender for this genus; and the coloration (a row of seven dark blotches on the soft dorsal fin with irregular blackish blotches on other fins and oblique washes on head and body) is distinctive. Taken together, these characters separate *glauerti* from all the many species which have been associated with *Antennarius* by authors. Some of the 130-odd nominal species of "*Antennarius*" in the broadest sense were originally described in the older genus *Lophius* or the preoccupied one, *Chironectes,* which *Antennarius* replaced; and some are nowadays regarded as generically distinct from *Antennarius* (i.e., as *Pterophrynoides,* with many synonyms, *Trichophryne, Histiophryne,* etc.)

OCCURRENCE OF THE TRAP-DOOR SPIDER *CONOTHELE MALAYANA* (DOLESCHALL) IN AUSTRALIA [MYGALOMORPHAE : CTENIZIDAE]

By BARBARA YORK MAIN, Zoology Department,
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INTRODUCTION

Conothele is an Oriental-Australasian genus having closest affinity with the Palaearctic-Neotropical genus *Ummidia* and probably representing a geographic replacement of this genus. Of the 11 species of *Conothele,* 2 are restricted to the Orient, 8 are Australasian, while one species, *C. malayana,* ranges from Amboina, through New Guinea into Australia (Roewer, 1942). Of the 8 strictly Australasian species only one, *C. doleschalli,* has been recorded from the Australian mainland (Somerset, Cape York). This species is possibly synonymous with *malayana. C. arboricola,* originally described from New Britain is now also known from Thursday Island (H. T. Phillipps and H. M. Hockings, personal communication and *in litt.*). This species builds its nests in the bark of trees. The nests collected by Mr. Tarlton Phillipps and Mr. H. M. Hockings were cigar-shaped structures, none exceeding an inch in length, made of silk-bound bark fragments and closed by a flat, wafer-like bark door. The nests were smoothly lined with silk. Pocock (1899, Plate X, Fig. 3a) has figured a nest of this spider. So far as is known the remaining species of *Conothele* are terrestrial burrowers.

Literature records indicate that within Australia, *Conothele malayana* is known from Darwin and the Northern Territory (Rainbow, 1907, 1911). Specimens collected by the author (and one specimen by Mr. H. T. Phillipps) show that it is actually widespread through inland Australia. Hitherto only the female has been recorded, but there are in the National Museum, Melbourne, several male specimens, one of which is here described and designated allotype.

TAXONOMY

Genus *CONOTHELE* Thorell, 1878

Thorell (1878: 304-5) erected the genus *Conothele* for Doleschall's species, *Cteniza malayana.*

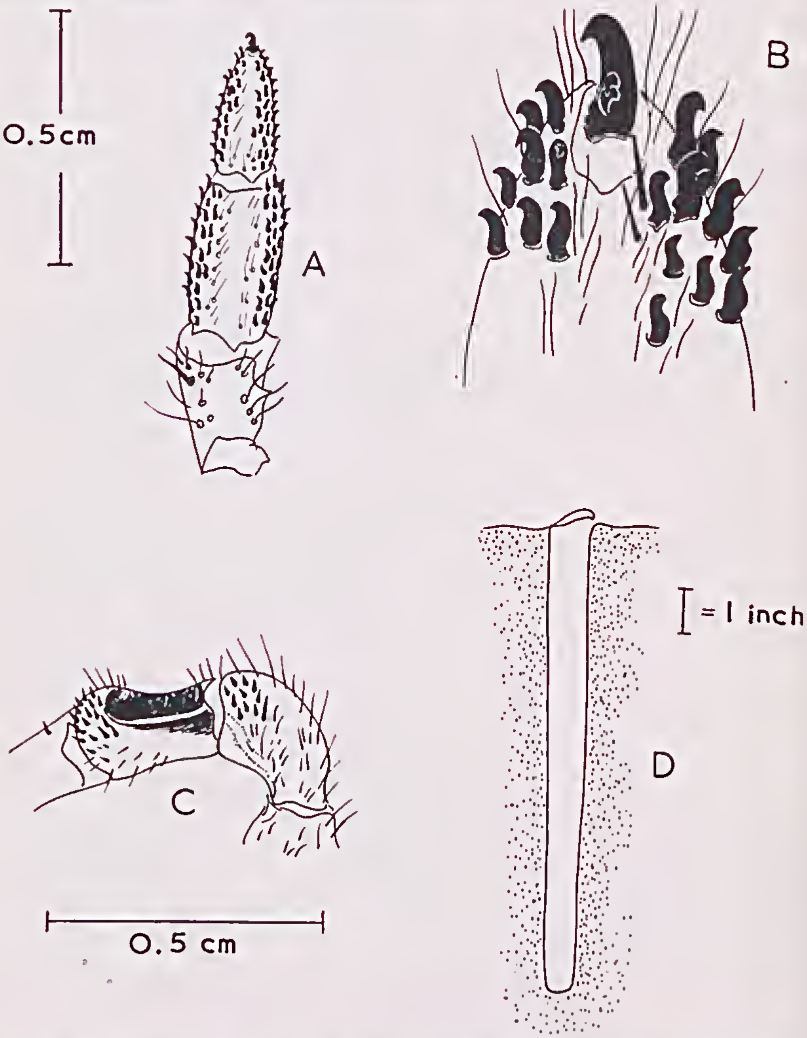

Fig. 1.—*Conothele malayana* (Doleschall). A, B, C, female specimens. A, left palp, ventral view, spination. B, tip of tarsus of left palp, ventral view, spination (grossly enlarged). C, tibia III, prolateral view. D, profile of burrow.

Diagnosis: The only genus of the group Pachylomereae occurring in Australia. Distinguishable from other Australian Ctenizid genera by the following characters: Presence of a dorsal, glabrous depression on the third tibia (Fig. 1 C); densely aggregated, stout, crotchet-shaped spines along lateral margins of ventral faces of palpal tarsus and tibia (Fig. 1 A-B) and tarsus, metatarsus and tibia of legs I and II; waxy, hairless carapace which is elevated just behind the eyes, whence it slopes downwards in all directions.

Fig. 2 shows profile of carapace and abdomen.

Conothele malayana (Doleschall, 1859)

Literature:—

Cteniza malayana Doleschall, 1859. *Act. Soc. Ind. Neerl,* 5: 5. Pl. 6, f.8.

Conothele malayana Thorell, 1878. *Ann. Mus. civ. Genova,* 13: 305.

Conothele malayana Simon, 1892. *Hist. Nat. Araign.,* i (1): 38.

Conothele malayana Rainbow, 1907. *Austr. Nat.,* i (6): 76.

Conothele malayana Rainbow, 1911. *Rec. Austr. Mus.,* 9: 110.

Description of allotype (male)

In the following description the leg index (given below the leg formula) is the length of the leg divided by the length of the carapace and the tibial index is the proximal width of the patella expressed as a percentage of the combined lengths of the tibia and patella (Petrunkevitch, 1942).

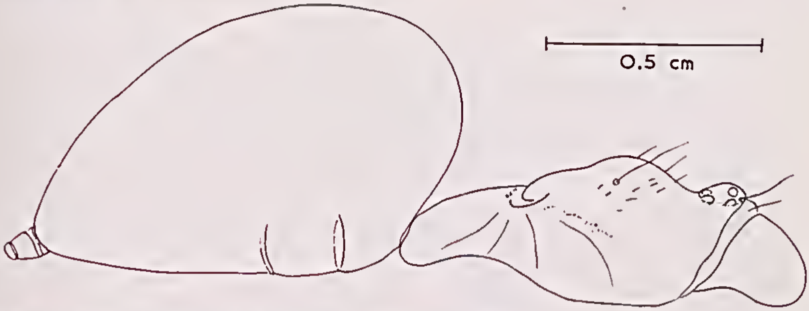

Fig. 2.—*Conothele malayana* (Doleschall), female. Profile view of carapace and abdomen.

Dimensions: Abdomen, slightly shrunken; carapace length, 7.3 mm.; carapace width, 7.2 mm.; eye group: width, 1.5 mm., length, 1.1 mm., sternum + labium: length, 5.6 mm., width, 3.9 mm. (a second specimen from the same locality and in the collection of the National Museum has carapace length of 8.6 mm.).

Colour: Carapace and chelicerae black; sternum, labium, maxillae reddish-brown; abdomen grey-brown; legs I and II basally up to proximal part of tibia black, distally red-brown, III and IV red-brown; palps red-brown except tarsus yellowish.

Carapace granulose, free from hairs. **Abdomen** with widely spaced tuberculate spines. **Sternum** with scattered bristles around margin, sigilla faintly visible. **Maxillae** with cuspules scattered all over ventral surface. **Labium** with 6 cuspules. [Dorsal aspect of specimen shown in Fig. 3 A, sternum and labium Fig. 3 B.]

Legs with scopula on tarsi I and II. Superior tarsal claws with one tooth.

Leg formula and index	4	1	2	3
	2.47	2.43	2.18	1.95

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	6.2 mm.	3.3	4.0	3.1	1.1	17.7
II	5.4	3.0	3.4	3.0	1.1	15.9
III	4.2	2.6	2.8	3.0	1.6	14.2
IV	5.7	2.8	3.8	4.0	1.7	18.0
Palp	4.1	2.4	3.7	—	1.5	11.7

Width of patella I at "knee," 1.2 mm. Tibial index, 16.44.
Width of patella IV at "knee," 1.2 mm. Tibial index, 18.18.

Spines: Leg I; femur, 2 ventral apical and short stout dorsal spines; patella, about 10 ventral; tibia, about 14 pro-latero-ventral and 15 retro-latero-ventral; metatarsus, 6 retro-latero-ventral. Leg II; femur, short stout spines; patella, 3 ventral; tibia, 3 pro-latero-ventral, 10 retro-latero-ventral; metatarsus, 3 retro-latero-ventral. Leg III; femur, a few short stout spines; patella, about 17 pro-lateral and 5 retro-lateral; tibia, ventral spine-like bristles, about 18 distal dorsal and 2 proximal dorsal; metatarsus, ventral spine-like bristles, 2 pro-latero-dorsal and 5 retro-latero-dorsal. Leg IV; femur, a few short stout spines; tibia, spine-like ventral bristles; metatarsus, spine-like ventral bristles. Palp; tarsus, dorsal cluster of small spines.

External genitalia:

Palpal structures. Tibia without spines or processes. Slightly twisted stigma (Fig. 3 C-D) in which feature it differs from the only other known male specimen of *Conothele*, i.e., *C. nigriceps* Pocock (Pocock, 1898, Pl. XIX, Fig. 1).

Tibia of first leg also lacks specialised spines and processes of any kind.

Locality: Forrest River Mission (Wyndham), Western Australia (collected by K. J. Coaldrake).

NATURAL HISTORY

Life history

Eggs are laid during mid-summer and apparently hatch during late summer, with the young dispersing by the beginning of the winter. Only one egg cocoon has been collected, lying free at the bottom of a burrow, 5 miles south of Pioneer (south of Norseman) on December 28, 1952. The cocoon was white, soft and silky in texture, not papery and without visible sutures. It contained 41 eggs, the diameter of which ranged between 1.8 mm. and 2.0 mm. Development at date of collection was at the stage where the structure of appendages and abdominal tergites were apparent. Three broods have been observed in the parent burrows as follows: April 8, 1955, Wubin, 4 miles east; April 9, 1955, Great Northern Highway, 17 miles N.E. No. 2 Rabbit Proof Fence; April 10, 1955, Payne's Find, 6 miles east. Upon being collected the brood animals immediately produced copious amounts of gossamer and soon filled the tubes with a mass of such strands, from which it is deduced that the young are aerially dispersed. Aerial dispersal has not been observed for any other Australian Mygalomorphae and is

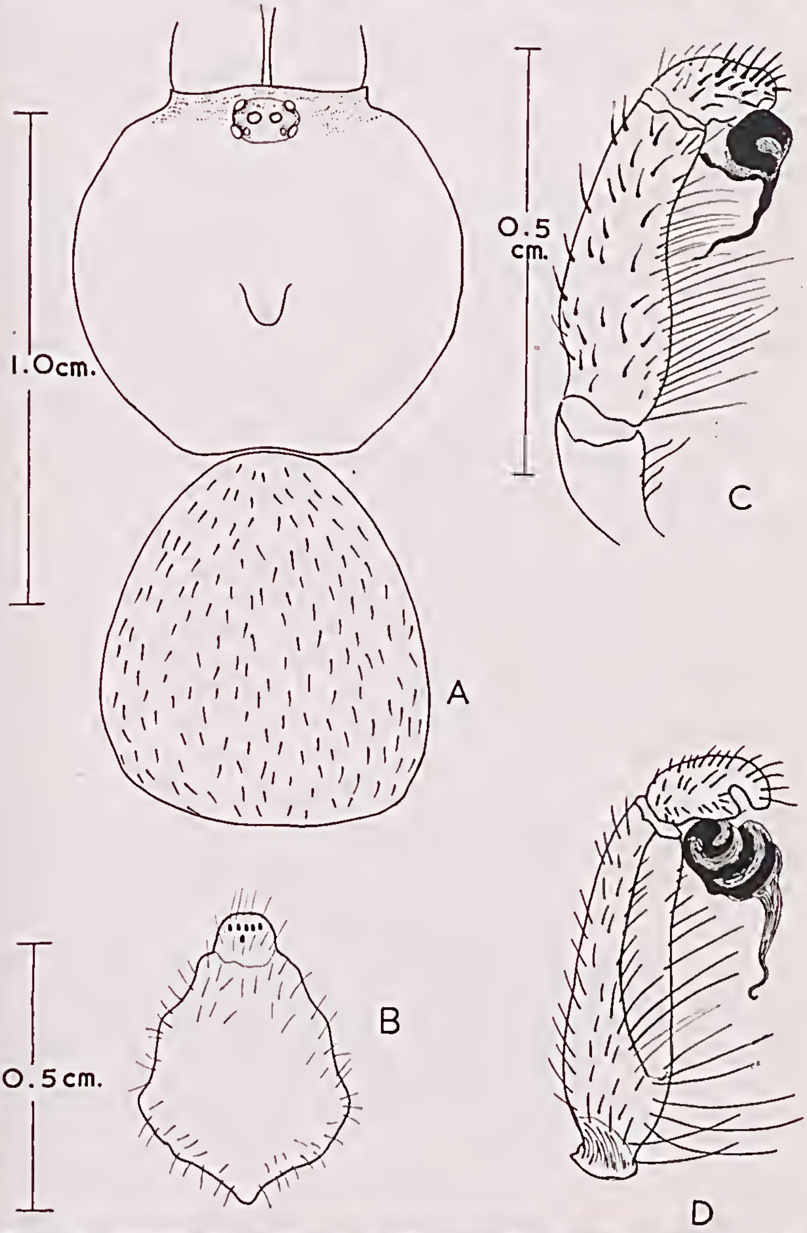

Fig. 3.—*Conothele malayana* (Doleschall), male, allotype. A, cephalothorax and abdomen, dorsal view. B, sternum and labium. C, right pedipalp, retrolateral view. D, right pedipalp, ventral view.

indeed rare for Mygalomorphae generally. However, amongst those definitely known to produce gossamer is the genus *Ummidia (=Pachylomerus)* which is closely related to *Conothele.*

It is not known definitely when the males wander to mate. However, specimens in the National Museum are dated "November"—thus if this indicates time of collection the animals must run in the early summer which in this region marks the rainy season. This is consistent with the observation that all male Mygalomorphs run (and mate) with humid conditions at the break of the wet season.

Moulting

The only information on moulting of this species is for a specimen kept alive in the laboratory. This specimen moulted some days prior to January 1, 1956 (which was 19 months after date of collection) and deposited the cast skin in several pieces outside the burrow about 1 inch from the entrance.

Feeding biology

Nothing is known of the natural food preferences of this species. Unlike many other Ctenizids it does not incorporate rejectamenta in the burrow wall but deposits it outside the burrow. A laboratory specimen has been maintained for two and a half years almost entirely on larvae and adults of the beetle *Tenebrio*, supplemented with occasional termites.

Predators

The only known instance of predation on *Conothele* is the observation of Dr. A. R. Main who collected a cast skin of the scorpion, *Isometroides vescus* (Karsch), from a burrow of *Conothele* at Golden Ridge on October 6, 1956. The spider had apparently been eaten by the scorpion which then moulted and vacated the burrow. *Isometroides* is a specialised predator on trapdoor spiders (Main, 1956).

Burrow

The burrow is always a vertical tube, very slightly inclined at the opening, slightly wider diameter in the upper portion, tapering towards the bottom (Fig. 1 D), with a continuous parchment-like silk lining. The lining can often be detached from the soil walls and lifted out entire. Burrows rarely exceed 10 inches in depth. The entrance is closed by a silk-bound soil door the margin of which fits tightly over the slightly raised rim of the burrow. The door is convex above, often higher at the free margin and hollowed out on the under side. The ventral silk-lined surface of many doors shows insertion marks of the fangs. A specimen in the laboratory characteristically pulls on the door with fangs and anterior tarsal claws when disturbed—when in such a position the animal has the venter facing the hinge line of the door.

Habitat

Specimens have been collected by the author throughout the sclerophyllous woodland zone (Gardner, 1944) of Western Australia, the Nullarbor Plain and acacia-saltbush association in South Australia. Most of the situations occur within a region of irregular summer rainfall. In most instances the sites were in bare litterless ground, of either clay or friable alluvial nature or powdery "pink" desert soil. The situations were usually ones which would be subjected to periodical sheet flooding after rain, and which probably remained relatively moist beneath the surface even though occurring in low rainfall areas. Some specimens have even been collected from the dry beds of braided river courses.

Geographic distribution (based on female and juvenile specimens in the author's collection):

Western Australia. Hall's Creek, 10 miles S.E., 1. Laverton, 2 miles west, 1. Great Northern Highway, 17 miles N.E. Rabbit Proof Fence, 2. Payne's Find, 6 miles E., 2. Wubin, 4 miles E., 1. Wubin. 2 miles E., 1. Pintharuka, E. of on Gullewa-Yalgoo Road, 1. Kadji Gate, 1 mile N., 1. Woolaga Creek, 4. Ebano Creek, 1. Caiguna Tank, 44 miles W., 1. Pioneer, 5 miles S., 1. Lakewood, 6 miles E., 2. Lakewood, 4 miles E., 2. Peak Charles, 4 miles N., 1. Noongaar, 2 miles W., 1. Jilakin Rock, 5 miles N., 1. Merredin, E. of, 1. Bruce Rock, 8 miles N., 1. Mt. Dick, 2. Connolly Gully, Brookton-Kelmscott Road, 1.

South Australia. Polygonum Tanks, 3 miles E., 1.

DISCUSSION

It is of interest that a terrestrial burrowing spider should range geographically from the Isle of Amboina, through New Guinea into Australia where it is widespread and has apparently not speciated. This implies that the spider is a relatively recent immigrant. Such a hypothesis is supported by the fact that the species has an aerial method of distribution which would facilitate a rapid expansion of range.

SUMMARY

Conothele malayana, previously reported from Amboina, New Guinea and northern Australia, is now recorded as being widespread throughout inland Western Australia. The hitherto unrecorded male is described and an allotype designated. Observations on natural history are given and aerial dispersal is noted. The species is considered to have been a recent immigrant to Australia.

ACKNOWLEDGMENTS

The female and juvenile specimens on which this report are based were collected by the author while in receipt of a University of Western Australia Research Grant. Mr. H. T. Phillipps collected one specimen from near Hall's Creek, which locality the author has not visited. Thanks are offered to Mr. R. T. M. Pescott, Director, National Museum, for permission to examine male specimens of *Conothele malayana* in the Museum collection, and to designate one of these as allotype.

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NEW RECORDS AND NOTES ON THE BIOLOGY OF FROGS FROM NORTH-WESTERN AUSTRALIA

By A. R. MAIN, Zoology Department, University of W.A.,
and
J. H. CALABY, Wildlife Survey Section, C.S.I.R.O.

INTRODUCTION

The North-West Province of Western Australia (see Fig. 1) is little known herpetologically. Mr. L. Glauert, Director of the Western Australian Museum, appears to have been the first herpetologist to visit and record collections from the area (Glauert, 1923), and during a subsequent visit he made collections of frogs among which was the new genus *Glauertia* (Loveridge, 1933). The only other local collector to visit the area before recent years was apparently the late Professor G. E. Nicholls. Some at least of his material was studied by Loveridge (1935) and Parker (1940).

During the last few years the following naturalists have collected frogs in various parts of the region:—W. Baggs and A. Snell, 1951; W. H. Butler, 1956; J. H. Calaby, 1955; A. M. Douglas, 1955; E. H. M. Ealey, 1954, 1956; E. P. Hodgkin, 1954; A. R. Main, 1953; W. B. Malcolm, 1955. These collections total approximately 50 specimens and contain several species not included in Main (1954), but none is undescribed. New data consist of range extensions and biological observations and these are the principal contributions of the present paper.

TAXONOMY AND BIOLOGY

HYLA RUBELLA Gray

Specimens

Wittenoom: 2. iii. 1954 (E.P.H.); ♂♂3. Rudall River, 4 miles downstream from Watrara Pool; 15. ix. 1955 (J.H.C.); ♂1, ♀1. Woodstock Station; June, 1954 (E.H.M.E.); ♂♂4.